

# Multibeam particle lithography

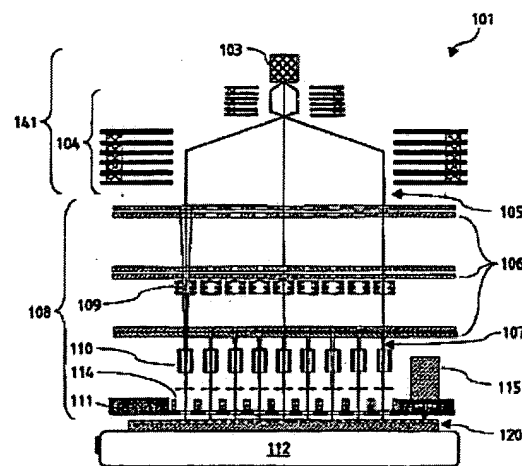
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Inventor: LOESCHNER HANS (AT); STENGL GERHARD (AT); VONACH HERBERT (AT)  
Applicant: IMS IONEN MIKROFAB SYST (AT)  
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## Abstract of GB2340991

Multibeam particle lithography apparatus comprising an illumination system 141 having a particle source 103 producing a beam of charged particles such as ions 105 and a multibeam optical system 108 comprising at least one aperture plate 106 having a plurality of apertures to form a plurality of sub-beams 107. The multibeam optical system focuses the sub-beams onto the surface of a substrate 120. A deflection unit 110 is provided for each sub-beam which can correct individual imaging aberrations with respect to the desired target position and/or position the sub-beam during the writing process. A collimator optical system 104 may be provided for producing a beam 105 which is substantially homogeneous across its cross-section. The size and shape of each sub-beam cross-section may be defined by the respective aperture of the first aperture plate. The multibeam optical system may provide a demagnified image of the aperture on the substrate surface with a demagnification factor of at least 20:1 and may be realised as an electrostatic lens column array. The deflection units may be electrostatic multipole electrode systems or may be travelling wave deflector means comprising segmented poles connected by inductive and capacitive elements to transfer the electric field from one segment to the next with a pre-determined speed. The deflection units may be organised and controlled synchronously in groups. The apparatus may comprise a reference plate 111 for alignment of the particle optical system and an optical alignment system 115 to adjust the position of the substrate with respect to the reference plate.



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